

## **IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicants : Thomas Hille and Lothar Deurer  
Serial No. : 09/486,266 Confirmation No.: 3529  
Filing Date : May 3, 2000

### **REMARKS**

In the Office Action mailed November 14, 2002, the Examiner acknowledged receipt of the Information Disclosure Statement. The Examiner has rejected claims 22-33, 35-39, 41-49, 53-55 and 57-66 under 35 U.S.C. 103(a) as being unpatentable over any of US Patent No. 4,390,520, DE 1667 944 ('944) or U.S. Patent No. 5,225,199, each by itself or in combination. The Examiner states that applicant's arguments filed August 29, 2002 are not persuasive. To unambiguously distinguish the present invention from prior art such that its inventiveness becomes apparent, applicant herein amends claim 22. The feature "comprising at least one active substance" was disclosed on page 7, last paragraph of the specification, and is integrated into the claim to better distinguish the present invention from the patch according to '944. The presence of the water-absorbing polymer is the subject matter of claim 41 which is deleted herein. Support for this amendment can be found in the specification on page 9, second full paragraph. The dependency of claim 42 is amended because of the deletion of claim 41.

The object of the present invention is to provide a transdermal therapeutic system that can be produced rationally and without curling effect as well as not causing sensation of a foreign body on the patient's skin in the course of prolonged wearing. To achieve the desired transdermal therapeutic patch, it has to be taken into account that the patient's skin perspires. The moisture being released by the skin underneath the transdermal therapeutic patch usually impairs adhesion of the plaster to the skin. However, to ensure an intimate contact of the patch with the patient's skin is of

particular importance in case of transdermal therapeutic patches, because the area of contact between the drug-containing reservoir and the skin determines the amount of active substance that may be delivered from the patch to the patient in a given time. The amount of active substance being delivered to the patient in a given period is crucial for the patient's plasma level of said active substance and therefore substantial for the therapeutic effectiveness of a transdermal therapeutic system. It becomes apparent that the therapeutic effectiveness is impaired if the drug-containing reservoir layer is not in contact with the skin with its entire skin-facing surface. Thus, to successfully provide a transdermal therapeutic system, it is most important to assure that the reservoir layer stays in contact with the patient's skin at all times during application. To do so, the transdermal system and in particular its reservoir layer has to be sufficiently adhesive. The adhesive forces have to withstand increasing tensile forces if the unidirectionally elastic transdermal therapeutic patch is extended.

As mentioned above, moisture of the skin will impair the adhesive forces between the patch/reservoir layer and the patient's skin. To overcome this problem, which has not been addressed in any one of the cited references, a water-absorbing polymer may be contained in the reservoir layer. Then, the moisture of the skin released due to its perspiration will be absorbed and will not affect the adhesive forces between the patch's reservoir layer and the patient's skin. Thus, the presence of a water-absorbing polymer within the reservoir layer assures an intimate contact between the drug-containing reservoir layer and the skin of a patient and avoids a detachment of the reservoir layer, such that the content of water-absorbing polymer within the reservoir layer of a transdermal therapeutic system substantially contributes to the therapeutic effectiveness of said system.

A water-absorbable polymer being suitable for transdermal therapeutic systems according to the present invention is polyvinylpyrrolidone, preferably with a molecular weight in the range

from  $1 \times 10^3$  to  $2 \times 10^6$ .

Applicant respectfully traverses the above-stated rejection. Applicant respectfully states that '520 discloses a transdermal analgesic adhesive comprising a pressure sensitive adhesive layer containing the drug and a flexible substrate. The flexible substrate is preferably expandable in at least one direction to prevent a disagreeable sense of tension (column 3, lines 1 and 2). The flexible substrate may have a moisture permeability of 5 to 2.000 g/m<sup>2</sup>/24hr (= 0.208 to 83.3 g/m<sup>2</sup>/hr) and may comprise vinyl pyrrolidone. However, said vinyl pyrrolidone is present as a functional monomer within an acrylic copolymer (column 3, lines 55-56, in combination with column 3, lines 13-18). In the case of the present invention, neither monomeric vinyl pyrrolidone nor a copolymer comprising vinyl pyrrolidone as a functional monomer is utilized as pressure-sensitive adhesive material. Instead, polyvinylpyrrolidone is used as water-absorbing polymer within the reservoir layer of the inventive transdermal therapeutic system. The disclosure in '520 does not discuss in any way any water absorbing substance and particularly does not suggest in any way a water-absorbing polymer as recited in presently amended claim 22. Applicant respectfully submits that '520 does not anticipate applicant's invention and respectfully requests that the rejection of the claims under 103(a) in view of '520 be withdrawn.

Applicant respectfully states that '944 relates to a conventional band aid comprising a woven fabric base which is elastically stretchable in transverse of longitudinal direction. '944 teaches woven fabric (see abstract) and neither discloses nor suggests placing any active ingredient or drug reservoir layer in or on the fabric; instead a conventional band aid as taught in '944 merely covers the skin to keep it clean. '944 does not relate to transdermal therapeutic systems which comprise an adhesive reservoir layer that contains at least one active substance to be administered to a patient in need thereof. The adhesive reservoir layer of transdermal therapeutic systems has to stay in contact

with the patient's skin at all times during application in order to assure drug delivery. Further, the size of the adhesive reservoir layer of transdermal therapeutic systems determines the amount of drug to be delivered to the patient's skin. The very different requirements to be met by conventional band aids on one hand and transdermal therapeutic systems on the other hand renders it unlikely that a skilled artisan would consider prior art related to conventional plasters, if transdermal therapeutic systems are to be realized. Therefore, the skilled artisan would not combine the disclosure of '944 with that of '520 in order to provide an improved transdermal therapeutic system.

'199 teaches a plaster comprising a film layer, an adhesive layer containing the drug, and another backing layer which may be removed before use in some embodiments. There is no disclosure nor suggestion within '199 that the adhesive layer may contain a water-absorbable polymer such as polyvinyl pyrrolidone. Thus, applicant respectfully requests that the rejection of the claims under 103(a) in view of '199 be withdrawn.

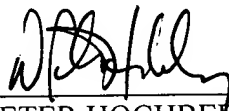
In summary, none of the cited references discloses a transdermal therapeutic system that contains a water-absorbing polymer as component of the drug containing reservoir layer. It appears that all of the above references are silent with respect to a reservoir layer containing a water-absorbing polymer. Hence, the advantageous properties of the transdermal therapeutic patch according to the present invention are unexpected and novel over cited prior art as well as inventive. Therefore, the present invention as defined by amended claim 22 (as submitted herewith) is neither disclosed in prior art nor was it made obvious to the skilled artisan at the time the present invention was made.

The Examiner states that the application currently names joint inventors and requests that applicant point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made. Applicant states that all claims were and are commonly owned.

It is respectfully submitted that the application is now in condition for allowance, and such action is requested. No new matter has been added. The examiner is invited to telephone the undersigned if there are any matters which could be discussed to expedite the prosecution of the above-identified application.

Respectfully submitted,

Date: February 11, 2003

  
D. PETER HOCHBERG, Reg. No. 24,603

DPH/KRV  
Attached: Marked Up Claims  
D. PETER HOCHBERG CO., L.P.A.  
1940 East 6<sup>th</sup> Street - 6<sup>th</sup> Floor  
Cleveland, Ohio 44114-2294  
(216) 771-3800



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Applicants : Thomas Hille and Lothar Deurer  
Serial No. : 09/486,266 Confirmation No.: 3529  
Filing Date : May 3, 2000  
Title : TRANSDERMAL THERAPEUTIC SYSTEM COMPRISING A  
RESERVOIR-TYPE PRESSURE-SENSITIVE ADHESIVE LAYER AND  
A BACK LAYER WITH UNI-DIRECTIONAL RESILIENCE  
Group Art Unit. : 1615 Examiner: Isis Ghali  
Attorney Docket : RO0254US.RCE (#90568)

**ATTACHMENT TO AMENDMENT**

MARKED UP CLAIMS SHOWING CHANGES RELATIVE TO THE ORIGINAL VERSION

22. (Thrice Amended) A transdermal therapeutic system comprising a detachable protective layer; a pressure-sensitive adhesive reservoir layer comprising at least one active substance; and a backing layer comprising a unidirectional elastic material having an elasticity of at least 20%, wherein the material is selected from the group consisting of a woven fabric and a nonwoven fabric, and wherein said reservoir layer contains a water-absorbing polymer.

Cancel claim 41.

42. (Once Amended) The transdermal therapeutic system of claim [41] 22 wherein the water-absorbing polymer is a polyvinylpyrrolidone.